

Remarks

Claims 1-17, 19-27, 29-31, 33-40, and 42-45 were pending in the application. Claims 1-17, 19-27, 29-31, 33-40, and 42-45 were rejected. No claims were merely objected to and no claims were allowed. By the foregoing amendment, no claims are canceled, no claims are amended, and claims 1 and 19 are added. No new matter is presented.

Claim Rejections-35 U.S.C. 112

Claims 1-17 were rejected under 35 U.S.C. 112(2). Appellants respectfully traverse the rejection.

Regarding the control 27, the Office asserted:

Specification discloses neither structure, software instructions nor an algorithm for controlling the scanning device 23 or the part holder 26. Although the Specification discloses providing the computer control 27 access to pre-stored data in a format to be inputted into a computer numeric control (CNC) program, the Specification does not describe the computer control 27 as a control implementing a CNC application. Even assuming that one of ordinary skill in the art would interpret paragraph 0021 of the Specification as describing a computer control implementing a CNC application, the Specification fails to either identify a particular CNC application used or explain how a conventional CNC application is adapted to control both the scanning device 23 and the part holder 26. Dependent claims 2-17 do not correct the indefiniteness of parent claim

7/2/10 Examiner's Answer, page 11, lines 11-20.

The Office then addressed the claimed "means for positioning..." The Office asserted:

In the instant application, the following portions of the specification and drawings may appear to describe the corresponding structure for performing the claimed function: Paragraph 0020 of the Specification discloses a “part holder,” which the same paragraph of the Specification describes as “any part holder or set of mechanical stages that may be used to bring an area of the part 22 mounted to a part holder 26 into proximity with the drill plane 28 of the laser beam 15.”

However, the specification and drawings do not disclose sufficient corresponding structure, material or acts for performing the claimed function. The term “part holder” as described in the Specification does not disclose any particular structure. Instead, the “part holder” as described in the Specification seeks to encompass any structure capable of performing the recited function of positioning the part for receiving the plurality of laser beams. Dependent claims 2-17 do not correct the indefiniteness of parent claim 1.

7/2/10 Examiner’s Answer, page 13, last two paragraphs.

The Office cited the *Altiris*, *WMS*, and *Aristocrat* cases. However, the Office did not establish sufficient factual analogy to those cases. In *Altiris*, for example, two elements were apparently at issue: a “means for booting”; and a “means for connecting”. The first means was held as being represented by commands. The court did not find invalidity relative to this element. Similarly, the “means for connecting” was not held invalid. The specification broadly identified use of an NIC.

In *WMS*, the at-issue limitations included “means for assigning a plurality of numbers...”, “means for randomly selecting one of said plurality of assigned numbers...”, and “means for stopping said reel...” A limitation of “means to start rotation of said reel...” was not at issue.

Regarding the means for assigning, this was construed as a microprocessor programmed to perform an illustrated algorithm of figure 6 which was an illustration showing how the symbols on a reel displayed to a player compared to the virtual electronic indicia reel generated by the random number generator. US Patent No. 4448419, col. 3, lines 33-36.

The means for randomly selecting were again generically and broadly construed as “A microprocessor programmed to perform random number generation.” 51 USPQ 2d 1392. No

specific random number generation algorithm was required.

Regarding the means for stopping, the court asserted that “the disclosed structure is a brake.” Again, no issue of validity was addressed. Rather, issues of interpretation involving whether “number” included “numbers” were involved. Appellants note that the term “brake” is a very functional term but generically is regarded as involving structure. The court did not apparently require a very specific braking structure to be described in detail and interpreted accordingly.

*Aristocrat* involved an electronic gaming machine for which the claim recited “display means...” and “game control means arranged to control images displayed...” and “selection means [that] are provided to enable the player to control a definition...”

The “game control means” were at issue. The court indicated that the examples of the results of the game operation were merely a description of the function and did not describe the underlying algorithm.

The present “computer means” and “computer control” both recite the structure of a computer. In the interest of advancing examination, this has been yet further clarified to merely state “computer” and to identify the necessary objective connections. This should not be treated as a 112(6) limitation. However, even if treated as a 112(6) limitation, a motion control algorithm is not in and of itself a novel algorithm. Accordingly, the existing basic algorithms could be used. This is distinguished, for example, from the situation where the algorithm must be developed. This, for example, is reflected in the Office’s cited cases which focus on only the wholly novel algorithm or a point of novelty addition to an existing algorithm. Known algorithms or portions thereof were not required to be recited in detail.

Regarding the means for positioning, the Office notes the term “movable part holder”. The Office has not established that this is insufficient referenced structure. For example, the Office has failed to engage in appropriate background fact finding under *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 86 S. Ct. 684, 15 L. Ed. 2d 545 (1966). For example, one of ordinary skill in the art would interpret the movable part holder structurally as one would structurally interpret the referenced brake in the *WMS*.

#### Claim Rejections-35 U.S.C. 102

Claims 1-9, 12-17, and 43 were rejected under 35 U.S.C. 102(b) as being anticipated by

Liu et al. (US6720519). Appellants respectfully traverse the rejection.

Appellants assert that claims 1-9, 12-17 and 43 are each individually patentable and not rendered obvious in view of U.S.P.N. 6,720,519 to Liu et al. (Liu ('519)). Appellants' claim 1 is an independent claim, and claims 2-9, 12-17 and 43 are all ultimately dependent upon independent claim 1.

As stated in MPEP §2131, "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. Of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the...claim." *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Liu ('519) does not teach each and every element of claim 1. Liu ('519) teaches away from the Appellants' claimed laser drilling apparatus of independent claim 1. Liu ('519) does not teach diagnostic feedback that measures an attribute of at least one of the laser pulses during the progress of the hole being drilled. The alignment of the microfilter taught by Liu ('519) can only be performed by the operator of the laser system either prior to, or after a drilling operation, but not while drilling is in progress.

Liu ('519) teaches placing a large area CCD camera directly in his light path to perform sub beam alignment (col. 12, lines 25-40). As can be seen in FIG. 3, when a CCD camera is placed in the position of image transfer lens 1150, the optical light path to the work piece 1155 is blocked. Drilling would be impossible until after the CCD camera is removed and the image transfer lens replaced. Due to this technical requirement, Liu ('519) cannot provide diagnostic feedback to a computer means, wherein the diagnostic feedback measures an attribute of at least one of said laser pulses during the progress of a hole being drilled as recited in Appellants' independent claim 1.

Appellants' independent claim 1 recites using diagnostic feedback to adjust the laser while drilling is in progress. The feedback provides information pertaining to the laser beam's temporal characteristics, alignment, and power output, and these parameters are adjusted as drilling progresses.

The Examiner asserts on page 6 of the Final Office action mailed September 20, 2007 that both feedback and feedback loops are taught by Liu ('519). The Examiner asserts Liu ('519) teaches multiple feedback systems are present such as actuators, tool path, laser attenuator, laser

optical elements and so forth. While Appellants acknowledge Liu ('519) generally discloses the aforementioned hardware, Liu ('519) does not teach, either explicitly or inherently, this hardware provides diagnostic feedback in Liu's apparatus by measuring an attribute of at least one of the laser pulses during the progress of a hole being drilled as recited in Appellants' independent claim 1. The presence of the aforementioned hardware does not create the inherent presumption the hardware of Liu ('519) is being used the same way and for the same purpose as the means for providing diagnostic feedback recited in Appellants' claim 1. Liu ('519) must provide some teaching, either explicitly or inherently, to one of ordinary skill in the art to utilize the aforementioned hardware as the means for providing diagnostic feedback recited in Appellants' claim 1. However, Liu ('519) does not provide any teachings whatsoever as evidenced by the disclosure at col. 12, lines 25-40, which teaches drilling would be impossible until after the CCD camera is removed and the image transfer lens replaced. This technical requirement taught by Liu ('519) effectively prevents the use of the aforementioned hardware as a means for providing diagnostic feedback as recited in Appellants' independent claim 1.

Appellants contend Liu does not anticipate each and every claim element recited in Appellants' independent claim 1, and thus cannot also anticipate each and every claim element of dependent claims 2-9, 12-17 and 43.

In light of the foregoing, Appellants respectfully request the Board find claims 1-9, 12-17 and 43 are not anticipated by Liu ('519), reverse the Examiner's final rejection of claims 1-9, 12-17 and 43, and determine claims 1-9, 12-17 and 43 are allowable.

#### Claim Rejections-35 U.S.C. 103

Claims 10, 11, 19-27, 29-31, 33-40, 42, 44, and 45 were rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. in view of Liu et al. (US6621045) and Boyle et al. (US2002/0170891). Appellants respectfully traverse the rejection.

Appellants assert that claims 10-11, 19-27, 29-31, 33-40 and 42 are each individually patentable and not rendered obvious in view of U.S.P.N. 6,720,519 to Liu et al. (Liu '519), and further in view of U.S.P.N. 6,621,045 to Liu et al. (Liu '045) and U.S.P.A.P. 2002/0170891A1 to Boyle et al. ("Boyle"). Appellants' claims 1, 19 and 31 are independent. Claims 10-11 are both ultimately dependent upon independent claim 1. Claims 20-27, 29 and 30 are both ultimately dependent upon independent claim 19. Claims 34-40 are ultimately dependent upon independent

claim 31.

As stated in MPEP §2143, “To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure.” *In re Vaack*, 20 USPQ2d 1438 (Fed. Cir. 1991).

Mere identification in the prior art of each element is insufficient to defeat the patentability of the combined subject matter as a whole. It must be explained why one of ordinary skill in the art would have been motivated to select the references and combine them to render the claimed invention obvious. Applicants' arguments stress the lack of motivation-suggestion-teaching. Rejections based on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *Lee*.

First, the Examiner asserts at page 6 of the Final Office action mailed September 20, 2007 the Appellants had argued Boyle teaches the use of a chamber which is not required by the instant claims. Appellants contend the Examiner is mistaken. Appellants were pointing out the differences between the teachings of Liu ('045) and Boyle which would effectively prevent one of ordinary skill in the art from being motivated to combine their teachings.

For instance, Liu ('045) discloses a system and method of using a prior art vacuum work piece holder in conjunction with a directed gas flow. Liu ('045) teaches balancing normal atmospheric pressure present under a flimsy work piece to be drilled against a deflection of a flimsy work piece in the direction of laser beam travel caused by the laser beams impinging on the work piece. Liu ('045) teaches using a negative pressure above the flimsy work piece surface where the laser beams impinge by using a gas flow. The flow of air across the top surface of the flimsy work piece creates a low pressure area that negates the effects of the impinging laser beams and maintains a constant laser focal plane.

In contrast, Boyle teaches a system of laser machining vias (a through connection in a multi layer printed circuit board (PCB) or integrated circuit (IC)) using a single pulsed laser

beam and a “cleanroom chamber.” The chamber is used to develop insulating, oxide linings for the vias. One of ordinary skill in the art recognizes Boyle’s use of his cleanroom is for a purpose entirely different from the use of the chamber taught by Liu (‘045).

Appellants’ claimed laser drilling apparatus of claim 19 does not require or use the system disclosed in Liu (‘045). Appellants’ claim element “a part chamber” of claim 19 does not compensate for deflections in flimsy work pieces that affect laser focus as taught by Liu (‘045). Moreover, Appellants’ claimed laser drilling apparatus of claim 19 does not require the attention to chemical reactions according to the combined teachings of Liu (‘045) and Boyle. Liu (‘045) teaches the use of a gas flow to create a reduced pressure in front of the target area of the work piece while Boyle teaches pulsed laser machining of a substrate inside an environmentally controlled chamber.

Secondly, in framing the present rejection, the Examiner fails to state a teaching, suggestion or motivation in the cited prior art for means for providing diagnostic feedback (Appellants’ claim 1), diagnostic feedback (Appellants’ claim 19), providing diagnostic feedback (Appellants’ claim 31) or even mention a diagnostic component recited in Appellants’ dependent claim 42. The Examiner merely asserts on page 6 of the Final Office action mailed September 20, 2007 that both feedback and feedback loops are taught by Liu (‘519).

As discussed above in response to the rejection under 35 U.S.C. §102(b), the Examiner asserts Liu (‘519) teaches multiple feedback systems are present such as actuators, tool path, laser attenuator, laser optical elements and so forth. While Appellants acknowledge Liu (‘519) generally discloses the aforementioned hardware, the combined teachings of Liu (‘519), Liu (‘045) and Boyle do not teach, suggest or motivate one of ordinary skill in the art to utilize this hardware to provide diagnostic feedback by measuring an attribute of at least one of the laser pulses during the progress of a hole being drilled as recited in Appellants’ independent claim 1. In framing the present final rejection, the Examiner has not identified any teaching or suggestion present in either Liu (‘045) or Boyle to motivate one of ordinary skill in the art to alter the teachings of Liu (‘519) and teach the means for providing diagnostic feedback (Appellants’ claim 1), diagnostic feedback (Appellants’ claim 19), providing diagnostic feedback (Appellants’ claim 31) or even mention a diagnostic component recited in Appellants’ dependent claim 42. Neither Liu (‘045) nor Boyle teach or suggest the means for providing diagnostic feedback (Appellants’ claim 1), diagnostic feedback (Appellants’ claim 19), providing diagnostic feedback

(Appellants' claim 31) or even mention a diagnostic component recited in Appellants' dependent claim 42.

Notwithstanding these facts, Appellants contend even if either Liu ('045) or Boyle taught any one of Appellants' claimed diagnostic feedback claim elements, Liu ('519) teaches at col. 12, lines 25-40, and as illustrated in Fig. 3, when a CCD camera is placed in the position of image transfer lens 1150, the optical light path to the work piece 1155 is blocked. Drilling would be impossible until after the CCD camera is removed and the image transfer lens replaced. This technical requirement taught by Liu ('519) effectively prevents the use of the aforementioned hardware as a means for providing diagnostic feedback as recited in Appellants' claims 1, 19, 31 and 42.

Appellants contend the combined teachings of Liu ('519) in view of Liu ('045) and Boyle does not teach, suggest or provide the requisite motivation to one of ordinary skill in the art to alter their combined teachings and teach each and every claim element recited in Appellants' independent claims 1, 19 and 31, and thus cannot also render obvious each and every claim element of dependent claims 10-11, 20-27, 29-30, 33-40 and 42.

In light of the foregoing, Appellants respectfully request the Board find claims 10-11, 19-27, 29-31, 33-40 and 42 are not obvious in view of the combined teachings of Liu ('519) in view of Liu ('045) and Boyle, reverse the Examiner's final rejection of claims 10-11, 19-27, 29-31, 33-40 and 42, and determine claims 10-11, 19-27, 29-31, 33-40 and 42 are allowable.

Accordingly, Appellants submits that claims 1-17, 19-27, 29-31, 33-40, and 42-45 are in condition for allowance. Reconsideration and further examination are requested. Please charge any fees or deficiency or credit any overpayment to our Deposit Account of record.

Respectfully submitted,

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